

### **In the Claims:**

The claims are as follows:

1. (Previously presented) A method for filling empty cells of a range of cells in a multi-dimensional spreadsheet comprising a plurality of cells identified by a cell address along each dimension of the spreadsheet, said method comprising the steps of:

selecting the range of cells, said range comprising a plurality of sample cells and one or a plurality of empty cells, wherein prior to said selecting each sample cell contains a sample value and an empty cell contains no value or a value not considered as a sample value; the content  $y_i$  of each sample cell and each empty cell being associated with a particular value  $x_i$  of a variable  $x$ ;

after said selecting, ordering the sample cells and the empty cells according to the values  $x_i$  associated with the content of said cells;

after said ordering, processing the empty cells comprising, for each empty cell, the steps of:

identifying the value  $x_i$  associated with the content of the empty cell;

selecting one or a plurality of previous sample cells with respect to the empty cell;

selecting one or a plurality of next sample cells with respect to the empty cell;

computing the value  $y_i$  of the empty cell according to the values  $y_{\text{previous}}$  contained in the selected one or plurality of previous sample cells, and the values  $y_{\text{next}}$  contained in the selected one or plurality of next sample cells;

filling the empty cell with said computed value  $y_i$ ; and

after said processing the empty cells, displaying the spreadsheet via a graphical user interface (GUI).

2. (Previously presented) The method of claim 1, wherein said step of computing the value  $y_i$  of each empty cell according to the values  $y_{\text{previous}}$  contained in the selected one or plurality of previous sample cells, and the values  $y_{\text{next}}$  contained in the selected one or plurality of next sample cells, comprises the further step of:

computing the value  $y_i$  of the empty cell according to the values  $x_{\text{previous}}$  associated with the content  $y_{\text{previous}}$  of the selected one or plurality of previous sample cells, and the values  $x_{\text{next}}$  associated with the content  $y_{\text{next}}$  of the selected one or plurality of next sample cells.

3-6. (Canceled)

7. (Previously presented) The method of claim 1, wherein the selected range of cells further comprises variable cells, a variable cell containing a value  $x_i$  associated with the content  $y_i$  of a particular sample cell or a particular empty cell.

8. (Previously presented) The method of claim 1, wherein the step of computing the value  $y_i$  of an empty cell comprises the step of computing the value  $y_i$  as equal to:

$$y_i = y_{\text{previous}} + (x_i - x_{\text{previous}}) * ((y_{\text{next}} - y_{\text{previous}}) / (x_{\text{next}} - x_{\text{previous}}))$$

where :

$y_{\text{previous}}$  is the content of a previous cell containing a sample;

$x_{\text{previous}}$  is the value of the variable  $x$  associated with the content of the previous cell containing a sample;

$y_{\text{next}}$  is the content of a following cell containing a sample;

$x_{\text{next}}$  is the value of the variable  $x$  associated with the content of a following cell containing a sample;

$x_i$  is the value of the variable  $x$  associated with the empty cell.

9. (Previously presented) The method of claim 1, wherein said selected range of cells comprises a double column or double row range of cells, said range of cells comprising  $2N$  cells, wherein the  $i$ -th cell in a first column or first row comprises a value  $x_i$  and the second column or second row comprises a value  $y_i = f(x_i)$ .

10. (Previously presented) The method of claim 1, wherein the step of filling cells comprises the further step of: defining a table and associating said table with the selected range of cells, said table comprising for each empty cell  $i$ :

an “index field” for identifying said empty cell;

a “sample field” for indicating that said cell is an empty cell;

a “ $X_i$  field” with the value  $x_i$  associated with said empty cell;

an “index of previous sample field” with the value of the “index field” of a previous record having a sample value;

a “ $X_{\text{prev. sample}}$  field” with the value of the “ $X_i$  field” of a previous record having a sample value;

a “f(Xprev. sample) field” with a value  $y = f(x)$  of a cell in the range corresponding to a previous record having a sample value;

an “index of next sample field” with a value of the “index field” of a next record having a sample value;

a “Xnext sample field” with a value of the “ $X_i$  field” of a next record having a sample value;

a “f(Xnext sample) field” with a value  $y = f(x)$  of a cell in the range corresponding to a next record having a sample value.

11. (Previously presented) The method of claim 10, wherein said table further comprises for each sample cell i:

an “index field” for identifying said sample cell;

a “sample field” for indicating that said cell is a sample cell;

a “ $X_i$  field” with the value  $x_i$  associated with said sample cell;

the “index of previous sample field” with the value of the “index field” of said sample cell;

a “Xprev. sample field” with the value of the “ $X_i$  field” of said sample cell;

the “f(Xprev. sample) field” with the value  $y = f(x)$  of said sample cell;

the “index of next sample field” with the value of the “index field” of said sample cell;

the “Xnext sample field” with the value of the “ $X_i$  field” of said sample cell;

the “f(Xnext sample) field” with the value  $y = f(x)$  of said sample cell.

12. (Previously presented) The method of claim 11, wherein said table comprises N records, where N equals the number of rows in a single or double column range of cells or the number of columns in a single or double row range of cells.

13. (Previously presented) A computer system comprising a processor and a memory coupled to the processor, said memory containing instructions that when executed by the processor implement the method of claim 1.

14. (Previously presented) A computer program comprising instructions adapted for carrying out the method of claim 1 when said computer program is executed on a computer, said computer program comprising said instructions being stored on a memory device of a computer system.

15. (Previously presented) The method of claim 1, further comprising: responsive to an occurrence of at least one event, automatically again performing said processing the empty cells, wherein the at least one event is selected from the group consisting of

- a change of one or a plurality of sample cells in the range,
- a change of one or a plurality of empty cells in the range,
- an addition of one or a plurality of sample cells in the range,
- an addition of one or a plurality of empty cells in the range,
- a deletion of one or a plurality of sample cells in the range,
- a deletion of one or a plurality of empty cells in the range, and
- combinations thereof.

16. (Previously presented) The method of claim 15, wherein the at least one event comprises said change of one or a plurality of sample cells in the range.

17. (Previously presented) The method of claim 15, wherein the at least one event comprises said change of one or a plurality of empty cells in the range.

18. (Previously presented) The method of claim 15, wherein the at least one event comprises said addition of one or a plurality of sample cells in the range.

19. (Previously presented) The method of claim 15, wherein the at least one event comprises said addition of one or a plurality of empty cells in the range.

20. (Previously presented) The method of claim 15, wherein the at least one event comprises said deletion of one or a plurality of sample cells in the range.

21. (Previously presented) The method of claim 15, wherein the at least one event comprises said deletion of one or a plurality of empty cells in the range.

22. (Previously presented) The method of claim 1, further comprising designating the selected range of cells as a persistent sampled range of cells (PSROC).

23. (Previously presented) The method of claim 22, wherein a background color of the selected

range of cells is a first color before said designating the selected range of cells as a PSROC, and wherein after said designating the selected range of cells as a PSROC the method further comprises changing the background color of the selected range of cells to a second color that differs from the first color.

24. (Previously presented) The method of claim 1, wherein for at least one empty cell of said empty cells:

said one or a plurality of previous sample cells consists of said plurality of previous sample cells,

said one or a plurality of next sample cells consists of said plurality of next sample cells,  
or

said one or a plurality of previous sample cells consists of said plurality of previous sample cells and said one or a plurality of next sample cells consists of said plurality of next sample cells.